

Reconsideration of the above-referenced application in view of the above amendment, and of the following remarks, is respectfully requested.

Claims 1-13 are pending in this case. Claims 4, 5, and 7 are amended herein and claim 13 is added herein to more completely cover that which Applicant regards as the invention.

The Examiner rejected claims 1 and 6 under 35 U.S.C. § 102(e) as being anticipated by Suehiro, et al.

Applicant respectfully submits that claim 1 is unanticipated by Suehiro as there is no disclosure or suggestion in the reference of forming a dielectric layer by providing a nitrogen containing gas, heating to an elevated temperature, and striking a plasma above a silicon-containing structure. Suehiro teaches forming a gate electrode that comprises polysilicon, silicon nitride, and tungsten. Suehiro teaches a variety of ways to form the thin silicon nitride layer. Only one of the manners taught in Suehiro involve both a plasma and heating. However, the plasma method taught is a remote plasma where the active species is carried to the wafer in a down flow. Suehiro does not disclose or suggest striking a plasma above a silicon containing structure. Accordingly, Applicant respectfully submits that claim 1 and the claims dependent thereon are unanticipated by Suehiro.

The Examiner rejected claims 2, 3, 7, 10 and 11 under 35 U.S.C. § 103(a) as being unpatentable over Suehiro and further in view of Sun.

Applicant respectfully submits that claim 2 and 3 are patentable over Suehiro in view of Sun as there is no disclosure or suggestion in the references of forming a dielectric layer by providing a nitrogen containing gas, heating to an elevated temperature, and striking a plasma above a silicon-containing structure. As discussed above, Suehiro only teaches a remote plasma combined with heating. Sun, at col. 2, lines 10-17, teaches high temperature nitridation or an

ammonia plasma. Applicant respectfully submits that Sun does not teach a combination of high temperature and a plasma, but merely two alternatives: (1) high temperature nitridation or (2) ammonia plasma. Accordingly, Applicant respectfully submits that claims 2 and 3 are patentable over Suehiro in view of Sun.

Applicant respectfully submits that claim 7 is likewise patentable over Suehiro in view of Sun as there is no disclosure or suggestion of creating a plasma above a bottom structure while providing a nitrogen containing gas and heating the bottom structure to an elevated temperature. As discussed above, Suehiro only teaches a remote plasma combined with heating and Sun does not teach a combined high temperature and plasma. Accordingly, Applicant respectfully submits that claim 7 and the claims dependent thereon are patentable over Suehiro in view of Sun.

The Examiner rejected claims 4 and 8 under 35 U.S.C. § 103(a) as being unpatentable over Suehiro in view of Sun as applied to claims 1 and 7, respectively, above, and further in view of Taft.

Taft is added by the Examiner to teach a silicon nitride gate dielectric. Applicant respectfully submits that claims 4 and 8 are patentable over the references for the same reasons discussed above relative to claims 1 and 7, from which the claims depend.

The Examiner rejected claims 5 and 9 under 35 U.S.C. § 103(a) as being unpatentable over Suehiro in view Sun as applied to claims 1 and 7, respectively, above, and further in view of Tseng.

Teng is added by the Examiner to teach a silicon nitride layer formed over a bottom electrode of a DRAM storage capacitor. Applicant respectfully submits

that claims 5 and 9 are patentable over the references for the same reasons discussed above relative to claims 1 and 7, from which the claims depend.

The Examiner rejected claim 12 under 35 U.S.C. § 103(a) as being unpatentable over Suehiro in view Sun as applied to claim 7 above, and further in view of Iyer.

Iyer is added by the Examiner to teach reacting N<sub>2</sub> and O<sub>2</sub> gases in a plasma discharge. Applicant respectfully submits that claim 12 is patentable over the references for the same reasons discussed above relative to claim 7, from which it depends.

Applicant respectfully submits that newly added claim 13 is patentable over the references as there is no disclosure or suggestion in the references of forming a gate dielectric by providing a nitrogen-containing gas, heating a substrate to an elevated temperature, and subjecting the substrate to a plasma. Suehiro teaches combining a plasma and elevated temperatures to form a silicon nitride layer between a polysilicon layer and a tungsten layer as part of a gate electrode. Suehiro is using the silicon nitride as a "reaction preventing film" rather than as a dielectric. Taft teaches silicon nitride as an interlevel dielectric. In contrast to the assertion by the Examiner, Taft does not teach silicon nitride as a gate dielectric. However, there is no suggestion for using the silicon nitride layer of Suehiro as a gate dielectric. As pointed out in the Background on page 2, lines 7-12, the electrical properties of standard deposited silicon nitride films are far inferior to thermal oxides when used as gate dielectrics. Accordingly, Applicant respectfully submits that claim 13 is patentable over the references.

The other references cited by the Examiner have been reviewed, but are not felt to come within the scope of the claims as amended.

In light of the above, Applicant respectfully requests withdrawal of the Examiner's rejections and allowance of claims 1-13. If the Examiner has any questions or other correspondence regarding this application, Applicant requests that the Examiner contact Applicant's attorney at the below listed telephone number and address.



Texas Instruments Incorporated  
P.O. Box 655474, M/S 3999  
Dallas, TX 75265  
972-271-1176 or 972-917-4437  
FAX 972-917-4418

Respectfully Submitted,

A handwritten signature in black ink, appearing to read "Jacqueline J. Garner".

Jacqueline J. Garner  
Reg. No. 36,144